

commodities, and wherein, for at least one commodity the opening messages comprise both buy and sell requests;

(b) [sending] generating electronic offer messages [generated by the intermediary computer program to the computer programs representing the participants] in accordance with objectives of the intermediated exchange, wherein [each of] the electronic offer messages [provides a proposed exchange of] comprise digital data representing offers to the participants to buy and/or to sell one or more commodities [offered by the intermediary computer program in accordance with objectives of the intermediated exchange] with each offer being less than or equal to the corresponding opening request, and wherein, for at least one commodity, the offer messages comprise both buy and sell requests, and, for each commodity, the total amount of all sell offers equals the total amount of all buy offers;

(c) [receiving by the intermediary computer program] generating electronic counter-offer messages [generated by the computer programs representing the participants] in accordance with the participants' individual exchange objectives, wherein [each of] the electronic counter-offer messages [provides responses to the proposed exchange of] comprise digital data representing further requests to buy and/or to sell one or more commodities [offered by the intermediary computer program,] with each further request being less than or equal to the corresponding opening request, and [wherein each of the counter-offer messages] wherein the counter-offer messages are generated in [accordance with objectives of the associated participants for exchange of commodities.] response to the previous electronic offer messages, and wherein, for at least one commodity, the counter-offer messages comprise both buy and sell requests; and

(d) repeating steps (b) and (c), if necessary, until [an exchange of commodities is] the offer messages are substantially satisfactory according to the individual exchange objectives of the participants [and] or according to the objectives of the intermediated exchange.

[87] 88. (Amended) The method of claim [86] 87, wherein the objectives of the intermediated exchange reflect the interests of the plurality of the participants.

[88] 89. (Amended) The method of claim [86] 87 further comprising [sending from the intermediary computer program to the programs of the participants] , before the step of generating opening messages, a step of generating a plurality of electronic initial messages, each of the electronic initial messages including digital data representing commodities that can be exchanged in the intermediated exchange.

[89] 90. (Amended) The method of claim [86] 87 further comprising [the intermediary computer program] , before the step of generating opening messages, a step of receiving and storing electronic objective messages from an operator of the electronic intermediated exchange, each of the electronic objective [message] messages including digital data representing the objectives of said intermediated exchange.

[90] 91. (Amended) The method of claim [86] 87, wherein the [intermediary computer program is based on] objectives of the intermediated exchange are represented by a parameterized utility function with constraints that reflect the interests of the plurality of the participants.

[91] 92. (Amended) A computer readable medium comprising encoded instructions for causing an electronic computer to [function according to claim 86] perform a method for an electronic intermediated exchange of a plurality of commodities among a plurality of participants comprising the electronic negotiation steps of:

generating electronic opening messages, wherein the opening messages comprise digital data representing opening requests of the participants to buy and/or to sell one or more commodities, and wherein, for at least one commodity the opening messages comprise both buy and sell requests;

generating electronic offer messages in accordance with objectives of the intermediated exchange, wherein the electronic offer messages comprise digital data representing offers to the participants to buy and/or to sell one or more commodities with each offer being less than or equal to the corresponding opening request, and wherein, for at least one commodity, the offer messages comprise both buy and sell requests, and, for each commodity, the total amount of all sell offers equals the total amount of all buy offers;

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generating electronic counter-offer messages in accordance with the participants' individual exchange objectives, wherein the electronic counter-offer messages comprise digital data representing further requests to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request, and wherein the counter-offer messages are generated in response to the previous electronic offer messages, and wherein, for at least one commodity, the counter-offer messages comprise both buy and sell requests; and repeating steps (b) and (c), if necessary, until the offer messages are substantially satisfactory according to the individual exchange objectives of the participants or according to the objectives of the intermediated exchange.

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[94] 95. The computer system of claim [92] 107 wherein [exchange of electronic messages between the intermediary computer program and computer programs representing the participants terminates when counter-offer messages accept all the terms offered in the immediately preceding electronic offer messages received from the intermediary computer program] offer messages are indicated as satisfactory when following counter-offer messages specify the same amounts to buy and to sell as specified in the offer messages.

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[95] 96. (Amended) The computer system of claim [92] 107 wherein the electronic memory [associated with the intermediary computer program] further stores digital data representing a plurality of bounds on selling or buying of each commodity by each of the [computer programs representing the] participants, and wherein the [commodity exchange] objectives of the [intermediary computer program] intermediated exchange include substantially maximizing [amount] amounts of commodities exchanged in the intermediated exchange subject to [constraints (i) that for each commodity the total amount sold equals the total amount bought by all computer programs representing the participants, and (ii)] the constraint that for each commodity the amount sold or bought by each [computer program representing the participants] participant is less than the appropriate one of the bounds.

[96] 97. (Amended) The computer system of claim [95] 96 wherein the [commodity exchange] step of generating offer messages in accordance with the objectives of the [intermediary computer program] intermediated exchange further [comprise that] comprises

substantially minimizing a measure of the unfairness of the share of commodities offered to each [computer program representing the participants is substantially minimized] participant.

[97] 98. (Amended) The computer system of claim [96] 97 wherein the measure of unfairness increases [substantially] as the share of commodities offered to each [computer program representing the participants] participant differs from a pro-rata share.

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[98] 99. (Amended) The computer system of claim [92] wherein the electronic offer messages (including the subsequent offer messages) include digital data representing amounts of commodities offered to the computer programs representing the participants, and] 107 wherein the [intermediary computer program generates the commodity amounts for] step of generating the electronic offer messages [by] further comprises substantially maximizing the value of a utility function of the amounts of commodities subject to constraints.

[99] 100. (Amended) The computer system of claim [98] 99 wherein the utility function comprises a difference of a first [terms] term and a second term, the first term representing the total amount of all commodities offered to the [computer programs of the] participants and the second term representing the unfairness of the share of commodities offered to the [computer programs of the] participants.

[102] 103. (Amended) The method of claim [101] 108 wherein the exchange objectives of the participant are expressed as procedural rules [which determine accepted amounts of commodities from offered amounts of commodities] , and wherein the step of generating counter-offer messages further comprises evaluating the rules.

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[103] 104. (Amended) The method of claim [101] 108 wherein the participant's exchange objectives are expressed according to [mean-variance] portfolio theory , and wherein the step of generating counter-offer messages further comprises evaluating the portfolio theory.

[104] 105. (Amended) The method of claim [103] 104 wherein the participant's exchange objectives are expressed as a utility function of commodity amounts, and wherein the step of generating counter-offer messages further comprises [accepted commodity amounts]

substantially [maximize] maximizing the utility function subject to maximum amount constraints [given by the offered commodity amounts].

[105] 106. (Amended) A computer readable medium comprising encoded instructions for causing an electronic computer to [function according to claim 62] perform a method for representing a participant in an intermediated exchange of commodities among a plurality of participants comprising:

generating an electronic opening message, wherein the electronic opening message comprises digital data representing opening requests of the participant to buy and/or to sell one or more commodities; and

generating one or more electronic counter-offer messages in accordance with the participant's individual exchange objectives,

wherein the electronic counter-offer messages comprise digital data representing (i) further requests to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request, or (ii) an indication that the previous offer message is satisfactory to the participant,

wherein, for at least one commodity, the electronic counter-offer messages comprise both buy and sell requests, and

wherein each further request is generated in response to an electronic offer message comprising digital data representing offers to the participant to buy and/or to sell one or more commodities in accordance with objectives of the intermediated exchange.

Please add the following new claims:

107. (New) A computer system for electronic intermediated exchange of a plurality of commodities among a plurality of participants comprising

a processor, and

an electronic memory accessible to the processor for storing (i) digital data representing commodity exchange objectives of the intermediated exchange, and (ii) program instructions for causing the processor to perform the step of generating

electronic offer messages in accordance with objectives of the intermediated exchange until the offer messages are substantially satisfactory in accordance with the objectives of the intermediated exchange or are indicated to be satisfactory by the participants,

wherein the offer message are generated in response to (i) electronic opening messages, which comprise digital data representing initial requests of the participants to buy and/or to sell one or more commodities, and (ii) electronic counter-offer messages, which comprise digital data representing further requests of the participants to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request,

wherein the electronic offer messages comprise digital data representing offers to the participants to buy and to sell one or more commodities with each offer is less than or equal to the corresponding opening request, and

wherein, for at least one commodity, the opening messages and the offer messages comprise both buy and sell requests, and, for each commodity, the total amount of all sell offers equals the total amount of all buy offers,

108. (New) A computer implemented method for representing a participant in an intermediated exchange of commodities among a plurality of participants comprising:

generating an electronic opening message, wherein the electronic opening message comprises digital data representing opening requests of the participant to buy and/or to sell one or more commodities; and

generating one or more electronic counter-offer messages in accordance with the participant's individual exchange objectives,

wherein the electronic counter-offer messages comprise digital data representing (i) further requests to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request, or (ii) an indication that the previous offer message is satisfactory to the participant,

wherein, for at least one commodity, the electronic counter-offer messages comprise both buy and sell requests, and

wherein each further request is generated in response to an electronic offer message comprising digital data representing offers to the participant to buy and/or to sell one or more commodities in accordance with objectives of the intermediated exchange.

109. (New) The method of claim 87 wherein commodity prices are externally given.

110. (New) The method of claim 87 wherein, after a number of repeats of steps (b) and (c), electronic counter-offer messages are generated so that there is at least one commodity and at least one participant for which the amount offered for sale or purchase is less than the amount previously offered.

111. (New) The method of claim 87 wherein the step of generating electronic offer messages further comprises finding a substantial extremum of a utility function subject to constraints.

112. (New) The method of claim 87 wherein the step of generating electronic counter-offer messages further comprises evaluating a portfolio theory method.

113. (New) The method of claim 87 wherein the step of generating electronic counter-offer messages further comprises evaluating rules.

114. (New) The system of claim 107 wherein commodity prices are externally given.

115. (New) The method of claim 108 wherein commodity prices are externally given.

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REMARKS

These amendments are to more particularly point out and distinctly claim that which the Applicants regard as their invention. They introduce no new matter.

APPENDIX

87. (Amended) A computer implemented method for an electronic intermediated exchange of a plurality of commodities among a plurality of participants comprising the electronic negotiation steps of:

(a) generating electronic opening messages, wherein the opening messages comprise digital data representing opening requests of the participants to buy and/or to sell one or more commodities, and wherein, for at least one commodity the opening messages comprise both buy and sell requests;

(b) generating electronic offer messages in accordance with objectives of the intermediated exchange, wherein the electronic offer messages comprise digital data representing offers to the participants to buy and/or to sell one or more commodities with each offer being less than or equal to the corresponding opening request, and wherein, for at least one commodity, the offer messages comprise both buy and sell requests, and, for each commodity, the total amount of all sell offers equals the total amount of all buy offers;

(c) generating electronic counter-offer messages in accordance with the participants' individual exchange objectives, wherein the electronic counter-offer messages comprise digital data representing further requests to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request, and wherein the counter-offer messages are generated in response to the previous electronic offer messages, and wherein, for at least one commodity, the counter-offer messages comprise both buy and sell requests; and

(d) repeating steps (b) and (c), if necessary, until the offer messages are substantially satisfactory according to the individual exchange objectives of the participants or according to the objectives of the intermediated exchange.

88. (Amended) The method of claim 87, wherein the objectives of the intermediated exchange reflect the interests of the plurality of the participants.

89. (Amended) The method of claim 87 further comprising, before the step of generating opening messages, a step of generating a plurality of electronic initial messages, each of the

electronic initial messages including digital data representing commodities that can be exchanged in the intermediated exchange.

90. (Amended) The method of claim 87 further comprising, before the step of generating opening messages, a step of receiving and storing electronic objective messages from an operator of the electronic intermediated exchange, each of the electronic objective messages including digital data representing the objectives of said intermediated exchange.

91. (Amended) The method of claim 87, wherein the objectives of the intermediated exchange are represented by a parameterized utility function with constraints that reflect the interests of the plurality of the participants.

92. (Amended) A computer readable medium comprising encoded instructions for causing an electronic computer to perform a method for an electronic intermediated exchange of a plurality of commodities among a plurality of participants comprising the electronic negotiation steps of:

- generating electronic opening messages, wherein the opening messages comprise digital data representing opening requests of the participants to buy and/or to sell one or more commodities, and wherein, for at least one commodity the opening messages comprise both buy and sell requests;

- generating electronic offer messages in accordance with objectives of the intermediated exchange, wherein the electronic offer messages comprise digital data representing offers to the participants to buy and/or to sell one or more commodities with each offer being less than or equal to the corresponding opening request, and wherein, for at least one commodity, the offer messages comprise both buy and sell requests, and, for each commodity, the total amount of all sell offers equals the total amount of all buy offers;

- generating electronic counter-offer messages in accordance with the participants' individual exchange objectives, wherein the electronic counter-offer messages comprise digital data representing further requests to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request, and wherein the counter-offer messages are generated

in response to the previous electronic offer messages, and wherein, for at least one commodity, the counter-offer messages comprise both buy and sell requests; and repeating steps (b) and (c), if necessary, until the offer messages are substantially satisfactory according to the individual exchange objectives of the participants or according to the objectives of the intermediated exchange.

95. The computer system of claim 107 wherein offer messages are indicated as satisfactory when following counter-offer messages specify the same amounts to buy and to sell as specified in the offer messages.

96. (Amended) The computer system of claim 107 wherein the electronic memory further stores digital data representing a plurality of bounds on selling or buying of each commodity by each of the participants, and wherein the objectives of the intermediated exchange include substantially maximizing amounts of commodities exchanged in the intermediated exchange subject to the constraint that for each commodity the amount sold or bought by each participant is less than the appropriate one of the bounds.

97. (Amended) The computer system of claim 96 wherein the step of generating offer messages in accordance with the objectives of the intermediated exchange further comprises substantially minimizing a measure of the unfairness of the share of commodities offered to each participant.

98. (Amended) The computer system of claim 97 wherein the measure of unfairness increases as the share of commodities offered to each participant differs from a pro-rata share.

99. (Amended) The computer system of claim 107 wherein the step of generating the electronic offer messages further comprises substantially maximizing the value of a utility function of the amounts of commodities subject to constraints.

100. (Amended) The computer system of claim 99 wherein the utility function comprises a difference of a first term and a second term, the first term representing the total amount of all commodities offered to the participants and the second term representing the unfairness of the

share of commodities offered to the participants.

103. (Amended) The method of claim 108 wherein the exchange objectives of the participant are expressed as procedural rules, and wherein the step of generating counter-offer messages further comprises evaluating the rules.

104. (Amended) The method of claim 108 wherein the participant's exchange objectives are expressed according to portfolio theory, and wherein the step of generating counter-offer messages further comprises evaluating the portfolio theory.

105. (Amended) The method of claim 104 wherein the participant's exchange objectives are expressed as a utility function of commodity amounts, and wherein the step of generating counter-offer messages further comprises substantially maximizing the utility function subject to maximum amount constraints.

106. (Amended) A computer readable medium comprising encoded instructions for causing an electronic computer to perform a method for representing a participant in an intermediated exchange of commodities among a plurality of participants comprising:

- generating an electronic opening message, wherein the electronic opening message comprises digital data representing opening requests of the participant to buy and/or to sell one or more commodities; and

- generating one or more electronic counter-offer messages in accordance with the participant's individual exchange objectives,

- wherein the electronic counter-offer messages comprise digital data representing (i) further requests to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request, or (ii) an indication that the previous offer message is satisfactory to the participant,

- wherein, for at least one commodity, the electronic counter-offer messages comprise both buy and sell requests, and

- wherein each further request is generated in response to an electronic offer message comprising digital data representing offers to the participant to

buy and/or to sell one or more commodities in accordance with objectives of the intermediated exchange.

107. (New) A computer system for electronic intermediated exchange of a plurality of commodities among a plurality of participants comprising

- a processor, and
- an electronic memory accessible to the processor for storing (i) digital data representing commodity exchange objectives of the intermediated exchange, and (ii) program instructions for causing the processor to perform the step of generating electronic offer messages in accordance with objectives of the intermediated exchange until the offer messages are substantially satisfactory in accordance with the objectives of the intermediated exchange or are indicated to be satisfactory by the participants,

- wherein the offer message are generated in response to (i) electronic opening messages, which comprise digital data representing initial requests of the participants to buy and/or to sell one or more commodities, and (ii) electronic counter-offer messages, which comprise digital data representing further requests of the participants to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request,

- wherein the electronic offer messages comprise digital data representing offers to the participants to buy and to sell one or more commodities with each offer is less than or equal to the corresponding opening request, and

- wherein, for at least one commodity, the opening messages and the offer messages comprise both buy and sell requests, and, for each commodity, the total amount of all sell offers equals the total amount of all buy offers,

108. (New) A computer implemented method for representing a participant in an intermediated exchange of commodities among a plurality of participants comprising:

generating an electronic opening message, wherein the electronic opening message comprises digital data representing opening requests of the participant to buy and/or to sell one or more commodities; and

generating one or more electronic counter-offer messages in accordance with the participant's individual exchange objectives,

wherein the electronic counter-offer messages comprise digital data representing (i) further requests to buy and/or to sell one or more commodities with each further request being less than or equal to the corresponding opening request, or (ii) an indication that the previous offer message is satisfactory to the participant,

wherein, for at least one commodity, the electronic counter-offer messages comprise both buy and sell requests, and

wherein each further request is generated in response to an electronic offer message comprising digital data representing offers to the participant to buy and/or to sell one or more commodities in accordance with objectives of the intermediated exchange.

109. (New) The method of claim 87 wherein commodity prices are externally given.

110. (New) The method of claim 87 wherein, after a number of repeats of steps (b) and (c), electronic counter-offer messages are generated so that there is at least one commodity and at least one participant for which the amount offered for sale or purchase is less than the amount previously offered.

111. (New) The method of claim 87 wherein the step of generating electronic offer messages further comprises finding a substantial extremum of a utility function subject to constraints.

112. (New) The method of claim 87 wherein the step of generating electronic counter-offer messages further comprises evaluating a portfolio theory method.

113. (New) The method of claim 87 wherein the step of generating electronic counter-offer messages further comprises evaluating rules.

114. (New) The system of claim 107 wherein commodity prices are externally given.

115. (New) The method of claim 108 wherein commodity prices are externally given.